SEQUENCE LISTING

<110> Institut Pasteur

<120>   PLASMODIUM FALCIPARUM ANTIGENS AND THEIR VACCINE AND
        DIAGNOSTIC APPLICATIONS

<130>   B5257AA_01.txt

<150>   CA 2,345,206
<151>   2001-05-16

<150>   CA 2,346,968
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<170>   PatentIn version 3.1

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aatgttataa aaagtgataa taaaaatgtt ataaaaagtg ataataaaaa tgattataaa   120

aagtgtaata aaaatgttat aaaaagtgat aataaaaatg ttataaaaag tgataataaa   180

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agtagagatg ataataatag tctctctaat agcgtagata atcaaagtaa tgtttttaaat   120

agagaagatc ctattgcttc tgaaactgaa gttgtaagtg aacctgagga ttcaagtagg   180

ataatgacta cagaagttcc aagtactact gtaaaacccc ctgatgaaaa acgatctgaa   240

gaagtaggag aaaaagaagc taaagaaatt aaagtagaac ctgttgtacc aagagccatt   300

ggagaaccaa tggaaaattc tgtgagcgta cagtcccctc ctaaggaatt c   351

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<400> 3

Glu Phe His Met His Asp Tyr Ile Tyr Asp Asp Arg Ile Tyr Asn Asn
1   5   10   15

Asp Lys Glu Lys Asn Val Ile Lys Ser Asp Asn Lys Asn Val Ile Lys
              20   25   30

Ser Asp Asn Lys Asn Asp Tyr Lys Lys Cys Asn Lys Asn Val Ile Lys
              35   40   45

Ser Asp Asn Lys Asn Val Ile Lys Ser Asp Asn Lys Asn Val Glu Phe
         50   55   60

<210> 4
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<213> Plasmodium falciparum

<400> 4

Glu Phe Pro Asp Pro Arg Ser Asn Asp Gln Glu Asp Ala Thr Asp Asp
1   5   10   15

Val Val Glu Asn Ser Arg Asp Asp Asn Asn Ser Leu Ser Asn Ser Val
              20   25   30

Asp Asn Gln Ser Asn Val Leu Asn Arg Glu Asp Pro Ile Ala Ser Glu
              35   40   45

Thr Glu Val Val Ser Glu Pro Glu Asp Ser Ser Arg Ile Met Thr Thr
         50   55   60

Glu Val Pro Ser Thr Thr Val Lys Pro Pro Asp Glu Lys Arg Ser Glu
65   70   75   80

Glu Val Gly Glu Lys Glu Ala Lys Glu Ile Lys Val Glu Pro Val Val
                 85   90   95

Pro Arg Ala Ile Gly Glu Pro Met Glu Asn Ser Val Ser Val Gln Ser
                 100   105   110

Pro Pro Lys Glu Phe
         115

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<213>  Plasmodium falciparum

<400>  5

Asp Asn Lys Asn Val
1                   5


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<400>  6

Asp Asn Lys Asn Asp
 1                  5


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Asp Lys Glu Lys Asn Val
1               5


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Lys Ser Asp Asn Lys Asn Val
1                   5


<210>  9
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Met Lys Thr Thr Lys Glu Asn Asp Asn Asn Asn Ile Val His Tyr Val
1               5                   10                  15

gat tgg ata aac cag att ttt aaa aag aat tct tta caa tgt gat tta          96
Asp Trp Ile Asn Gln Ile Phe Lys Lys Asn Ser Leu Gln Cys Asp Leu
              20                  25                  30

tat ttt ttg gat gac aac aaa gaa aaa gat gtt agt aag aaa aga aaa         144
Tyr Phe Leu Asp Asp Asn Lys Glu Lys Asp Val Ser Lys Lys Arg Lys
          35                  40                  45

gct caa ttg aag gat gaa tat gat aat ata tca agg agc aaa gaa aat         192
Ala Gln Leu Lys Asp Glu Tyr Asp Asn Ile Ser Arg Ser Lys Glu Asn
      50                  55                  60

att aat aat tcc aaa aaa ata aaa aat gaa tta agt ata aaa gat aat         240
Ile Asn Asn Ser Lys Lys Ile Lys Asn Glu Leu Ser Ile Lys Asp Asn
65                  70                  75                  80

atg cac gat tac ata tat gat gat cgt atc tac aat aat gat aaa gag         288
Met His Asp Tyr Ile Tyr Asp Asp Arg Ile Tyr Asn Asn Asp Lys Glu
                  85                  90                  95

aaa aat gtt ata aaa agt gat aat aaa aat gtt ata aaa agt gat aat         336
Lys Asn Val Ile Lys Ser Asp Asn Lys Asn Val Ile Lys Ser Asp Asn
              100                 105                 110

aaa aat gat tat aaa aag tgt aat aaa aat gtt ata aaa agt gat aat         384
Lys Asn Asp Tyr Lys Lys Cys Asn Lys Asn Val Ile Lys Ser Asp Asn
          115                 120                 125

aaa aat gtt ata aaa agt gat aat aaa aat gtt ata aaa agt gat aat         432
Lys Asn Val Ile Lys Ser Asp Asn Lys Asn Val Ile Lys Ser Asp Asn
      130                 135                 140

aaa aat gtt ata aaa agt gat tat aaa agt gat gat aga aat gct tgt         480
Lys Asn Val Ile Lys Ser Asp Tyr Lys Ser Asp Asp Arg Asn Ala Cys
145                 150                 155                 160

gat att tat aaa agt aat aaa aaa aat gtt cct gat aat tgc cat ata         528
Asp Ile Tyr Lys Ser Asn Lys Lys Asn Val Pro Asp Asn Cys His Ile
                  165                 170                 175

tat gat gat aat agt tca gtt gaa aat tta gat gga aaa aat aaa tta         576
Tyr Asp Asp Asn Ser Ser Val Glu Asn Leu Asp Gly Lys Asn Lys Leu
              180                 185                 190

aat aat ata agg aac ata cat aat gat aac tca tct tca tgc gat ata         624
Asn Asn Ile Arg Asn Ile His Asn Asp Asn Ser Ser Ser Cys Asp Ile
          195                 200                 205

tcc gat ata aaa agt gaa gat gaa tat ata gaa cca tat gaa aaa aag         672
Ser Asp Ile Lys Ser Glu Asp Glu Tyr Ile Glu Pro Tyr Glu Lys Lys
      210                 215                 220
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aat gaa gaa aat ata aat gaa tat aag aat aag aaa aat ata gcc aat        720
Asn Glu Glu Asn Ile Asn Glu Tyr Lys Asn Lys Lys Asn Ile Ala Asn
225                 230             235                 240

gaa aat ata aaa gaa gga aag agt tca att tat aat gat gaa cat aat        768
Glu Asn Ile Lys Glu Gly Lys Ser Ser Ile Tyr Asn Asp Glu His Asn
                    245             250                 255

tat aat tca tta tta tat aat tct tgt aat ggt gaa ata agt aag atc        816
Tyr Asn Ser Leu Leu Tyr Asn Ser Cys Asn Gly Glu Ile Ser Lys Ile
                260             265                 270

aac aaa ata agt agt cat aat aat att gat aat aat atg gat aat tat        864
Asn Lys Ile Ser Ser His Asn Asn Ile Asp Asn Asn Met Asp Asn Tyr
            275             280             285

aat acg ttt gca aat gtg aat aat ttt ata ata tat tcc tca gat gat        912
Asn Thr Phe Ala Asn Val Asn Asn Phe Ile Ile Tyr Ser Ser Asp Asp
        290             295             300

gaa gat aat ata tca aat tat tat aat ggt aaa gac gta tta aat gat        960
Glu Asp Asn Ile Ser Asn Tyr Tyr Asn Gly Lys Asp Val Leu Asn Asp
305             310             315                 320

gag att atg ttc cct ata aaa ttt aat ttt gaa aaa tta aaa aaa aat       1008
Glu Ile Met Phe Pro Ile Lys Phe Asn Phe Glu Lys Leu Lys Lys Asn
                325             330                 335

att tat gta ata gag cat ata gac aaa ata tat tat gat aca ttt tta       1056
Ile Tyr Val Ile Glu His Ile Asp Lys Ile Tyr Tyr Asp Thr Phe Leu
            340             345                 350

aat aaa aat cca agt gaa aaa agt gtt ttt atg aat gat gaa tct act       1104
Asn Lys Asn Pro Ser Glu Lys Ser Val Phe Met Asn Asp Glu Ser Thr
            355             360             365

ggt tat ttg aaa aat gat gtg aat gac aaa tgt gtt gtt gat aat ata       1152
Gly Tyr Leu Lys Asn Asp Val Asn Asp Lys Cys Val Val Asp Asn Ile
370             375             380

aat gtt att aat cct tct agt gtg aat acg ttg agt aat att tca aat       1200
Asn Val Ile Asn Pro Ser Ser Val Asn Thr Leu Ser Asn Ile Ser Asn
385             390             395                 400

att agg aat gaa aaa ata gaa aat aat aat aag aat gaa aaa tta ata       1248
Ile Arg Asn Glu Lys Ile Glu Asn Asn Asn Lys Asn Glu Lys Leu Ile
                405             410                 415

aaa tca tat cct aca caa tca aaa aat gtt atg agt aca ttt tcc ttt       1296
Lys Ser Tyr Pro Thr Gln Ser Lys Asn Val Met Ser Thr Phe Ser Phe
                420             425                 430

tgg aat att gaa aag gag aca ttt ata aca aaa cct ttg tat gca caa       1344
Trp Asn Ile Glu Lys Glu Thr Phe Ile Thr Lys Pro Leu Tyr Ala Gln
            435             440             445
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aat ttg aga aaa aaa caa ttt agt tta tta gat gaa tct gaa gag atg     1392
Asn Leu Arg Lys Lys Gln Phe Ser Leu Leu Asp Glu Ser Glu Glu Met
    450             455             460

ata aga aat tat tca tct aat caa tat tct ata aaa ttt gta cca aga     1440
Ile Arg Asn Tyr Ser Ser Asn Gln Tyr Ser Ile Lys Phe Val Pro Arg
465             470             475             480

cat tta tta tat gta atg agt caa gtt gct tct cga tcc ttt ttt gat    1488
His Leu Leu Tyr Val Met Ser Gln Val Ala Ser Arg Ser Phe Phe Asp
            485             490             495

cct tta tat aga aag cag tta ttt ttt cgt tac taa                    1524
Pro Leu Tyr Arg Lys Gln Leu Phe Phe Arg Tyr
            500             505
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<210>  10
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<212>  PRT
<213>  Plasmodium falciparum

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Met Lys Thr Thr Lys Glu Asn Asp Asn Asn Asn Ile Val His Tyr Val
1               5               10              15


Asp Trp Ile Asn Gln Ile Phe Lys Lys Asn Ser Leu Gln Cys Asp Leu
            20              25              30


Tyr Phe Leu Asp Asp Asn Lys Glu Lys Asp Val Ser Lys Lys Arg Lys
        35              40              45


Ala Gln Leu Lys Asp Glu Tyr Asp Asn Ile Ser Arg Ser Lys Glu Asn
    50              55              60


Ile Asn Asn Ser Lys Lys Ile Lys Asn Glu Leu Ser Ile Lys Asp Asn
65              70              75              80


Met His Asp Tyr Ile Tyr Asp Asp Arg Ile Tyr Asn Asn Asp Lys Glu
            85              90              95


Lys Asn Val Ile Lys Ser Asp Asn Lys Asn Val Ile Lys Ser Asp Asn
            100             105             110


Lys Asn Asp Tyr Lys Lys Cys Asn Lys Asn Val Ile Lys Ser Asp Asn
            115             120             125


Lys Asn Val Ile Lys Ser Asp Asn Lys Asn Val Ile Lys Ser Asp Asn
            130             135             140
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Lys Asn Val Ile Lys Ser Asp Tyr Lys Ser Asp Asp Arg Asn Ala Cys
145               150               155                   160

Asp Ile Tyr Lys Ser Asn Lys Lys Asn Val Pro Asp Asn Cys His Ile
            165               170                   175

Tyr Asp Asp Asn Ser Ser Val Glu Asn Leu Asp Gly Lys Asn Lys Leu
            180               185               190

Asn Asn Ile Arg Asn Ile His Asn Asp Asn Ser Ser Ser Cys Asp Ile
            195               200               205

Ser Asp Ile Lys Ser Glu Asp Glu Tyr Ile Glu Pro Tyr Glu Lys Lys
    210               215               220

Asn Glu Glu Asn Ile Asn Glu Tyr Lys Asn Lys Lys Asn Ile Ala Asn
225               230               235                   240

Glu Asn Ile Lys Glu Gly Lys Ser Ser Ile Tyr Asn Asp Glu His Asn
                245               250               255

Tyr Asn Ser Leu Leu Tyr Asn Ser Cys Asn Gly Glu Ile Ser Lys Ile
            260               265               270

Asn Lys Ile Ser Ser His Asn Asn Ile Asp Asn Asn Met Asp Asn Tyr
        275               280               285

Asn Thr Phe Ala Asn Val Asn Asn Phe Ile Ile Tyr Ser Ser Asp Asp
    290               295               300

Glu Asp Asn Ile Ser Asn Tyr Tyr Asn Gly Lys Asp Val Leu Asn Asp
305               310               315                   320

Glu Ile Met Phe Pro Ile Lys Phe Asn Phe Glu Lys Leu Lys Lys Asn
            325               330               335

Ile Tyr Val Ile Glu His Ile Asp Lys Ile Tyr Tyr Asp Thr Phe Leu
            340               345               350

Asn Lys Asn Pro Ser Glu Lys Ser Val Phe Met Asn Asp Glu Ser Thr
        355               360               365
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Gly Tyr Leu Lys Asn Asp Val Asn Asp Lys Cys Val Val Asp Asn Ile
    370             375             380

Asn Val Ile Asn Pro Ser Ser Val Asn Thr Leu Ser Asn Ile Ser Asn
385             390             395             400

Ile Arg Asn Glu Lys Ile Glu Asn Asn Asn Lys Asn Glu Lys Leu Ile
            405             410             415

Lys Ser Tyr Pro Thr Gln Ser Lys Asn Val Met Ser Thr Phe Ser Phe
            420             425             430

Trp Asn Ile Glu Lys Glu Thr Phe Ile Thr Lys Pro Leu Tyr Ala Gln
        435             440             445

Asn Leu Arg Lys Lys Gln Phe Ser Leu Leu Asp Glu Ser Glu Glu Met
    450             455             460

Ile Arg Asn Tyr Ser Ser Asn Gln Tyr Ser Ile Lys Phe Val Pro Arg
465             470             475             480

His Leu Leu Tyr Val Met Ser Gln Val Ala Ser Arg Ser Phe Phe Asp
            485             490             495

Pro Leu Tyr Arg Lys Gln Leu Phe Phe Arg Tyr
            500             505
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atg aaa ggg aaa atg aat atg tgt ttg ttt ttt ttc tat tct ata tta        48
Met Lys Gly Lys Met Asn Met Cys Leu Phe Phe Phe Tyr Ser Ile Leu
1               5                   10                  15

tat gtt gta tta tgt acc tat gta tta ggt ata agt gaa gag tat ttg        96
Tyr Val Val Leu Cys Thr Tyr Val Leu Gly Ile Ser Glu Glu Tyr Leu
            20                   25                  30

aag gaa agg ccc caa ggt tta aat gtt gag act aat aat aat aat aat       144
Lys Glu Arg Pro Gln Gly Leu Asn Val Glu Thr Asn Asn Asn Asn Asn
        35                  40                  45

aat aat aat aat aat aat agt aat agt aac gat gcg atg tct ttt gta       192
Asn Asn Asn Asn Asn Asn Ser Asn Ser Asn Asp Ala Met Ser Phe Val
        50                  55                  60

aat gaa gta ata agg ttt ata gaa aac gag aag gat gat aaa gaa gat       240
Asn Glu Val Ile Arg Phe Ile Glu Asn Glu Lys Asp Asp Lys Glu Asp
65                  70                  75                  80

aaa aaa gtg aag ata ata tct aga cct gtt gag aat aca tta cat aga       288
Lys Lys Val Lys Ile Ile Ser Arg Pro Val Glu Asn Thr Leu His Arg
                85                  90                  95

tat cca gtt agt tct ttt ctg aat atc aaa aag tat ggt agg aaa ggg       336
Tyr Pro Val Ser Ser Phe Leu Asn Ile Lys Lys Tyr Gly Arg Lys Gly
            100                 105                 110

gaa tat ttg aat aga aat agt ttt gtt caa aga tca tat ata agg ggt       384
Glu Tyr Leu Asn Arg Asn Ser Phe Val Gln Arg Ser Tyr Ile Arg Gly
            115                 120                 125

tgt aaa gga aaa aga agc aca cat aca tgg ata tgt gaa aat aaa ggg       432
Cys Lys Gly Lys Arg Ser Thr His Thr Trp Ile Cys Glu Asn Lys Gly
        130                 135                 140

aat aat aat ata tgt att cct gat aga cgt gta caa tta tgt ata aca       480
Asn Asn Asn Ile Cys Ile Pro Asp Arg Arg Val Gln Leu Cys Ile Thr
145                 150                 155                 160

gct ctt caa gat tta aaa aat tca gga tct gaa acg act gat aga aaa       528
Ala Leu Gln Asp Leu Lys Asn Ser Gly Ser Glu Thr Thr Asp Arg Lys
                165                 170                 175

tta tta aga gat aaa gta ttt gat tca gct atg tat gaa act gat ttg       576
Leu Leu Arg Asp Lys Val Phe Asp Ser Ala Met Tyr Glu Thr Asp Leu
                180                 185                 190

tta tgg aat aaa tat ggt ttt cgt gga ttt gat gat ttt tgt gac gat       624
Leu Trp Asn Lys Tyr Gly Phe Arg Gly Phe Asp Asp Phe Cys Asp Asp
            195                 200                 205
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gta aaa aat agt tat tta gat tat aaa gat gtt ata ttt gga acc gat        672
Val Lys Asn Ser Tyr Leu Asp Tyr Lys Asp Val Ile Phe Gly Thr Asp
    210             215             220

tta gat aaa aat aat ata tca aag tta gta gag gaa tca tta aaa cgt        720
Leu Asp Lys Asn Asn Ile Ser Lys Leu Val Glu Glu Ser Leu Lys Arg
225             230             235             240

ttt ttt aaa aaa gat agt agt gta ctt aat cct act gct tgg tgg aga        768
Phe Phe Lys Lys Asp Ser Ser Val Leu Asn Pro Thr Ala Trp Trp Arg
            245             250             255

agg tat gga aca aga cta tgg aaa act atg ata cag cca tat gct cat        816
Arg Tyr Gly Thr Arg Leu Trp Lys Thr Met Ile Gln Pro Tyr Ala His
            260             265             270

tta gga tgt aga aaa cct gat gag aat gaa cct cag ata aat aga tgg        864
Leu Gly Cys Arg Lys Pro Asp Glu Asn Glu Pro Gln Ile Asn Arg Trp
            275             280             285

att ctg gaa tgg ggg aaa tat aat tgt aga tta atg aag gag aaa gaa        912
Ile Leu Glu Trp Gly Lys Tyr Asn Cys Arg Leu Met Lys Glu Lys Glu
    290             295             300

aaa ttg tta aca gga gaa tgt tct gtt aat aga aaa aaa tct gac tgc        960
Lys Leu Leu Thr Gly Glu Cys Ser Val Asn Arg Lys Lys Ser Asp Cys
305             310             315             320

tca acc gga tgt aat aat gag tgt tat acc tat agg agt ctt att aat       1008
Ser Thr Gly Cys Asn Asn Glu Cys Tyr Thr Tyr Arg Ser Leu Ile Asn
            325             330             335

aga caa aga tat gag gtc tct ata tta gga aaa aaa tat att aaa gta       1056
Arg Gln Arg Tyr Glu Val Ser Ile Leu Gly Lys Lys Tyr Ile Lys Val
            340             345             350

gta cga tat act ata ttt agg aga aaa ata gtt caa cct gat aat gct       1104
Val Arg Tyr Thr Ile Phe Arg Arg Lys Ile Val Gln Pro Asp Asn Ala
            355             360             365

ttg gat ttt tta aaa tta aat tgt tct gag tgt aag gat att gat ttt       1152
Leu Asp Phe Leu Lys Leu Asn Cys Ser Glu Cys Lys Asp Ile Asp Phe
    370             375             380

aaa ccc ttt ttt gaa ttt gaa tat ggt aaa tat gaa gaa aaa tgt atg       1200
Lys Pro Phe Phe Glu Phe Glu Tyr Gly Lys Tyr Glu Glu Lys Cys Met
385             390             395             400

tgt caa tca tat att gat tta aaa atc caa ttt aaa aat aat gat att       1248
Cys Gln Ser Tyr Ile Asp Leu Lys Ile Gln Phe Lys Asn Asn Asp Ile
            405             410             415

tgt tca ttt aat gct caa aca gat act gtt tct agc gat aaa aga ttt       1296
Cys Ser Phe Asn Ala Gln Thr Asp Thr Val Ser Ser Asp Lys Arg Phe
            420             425             430
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tgt ctt gaa aag aaa gaa ttt aaa cca tgg aaa tgt gat aaa aat tct   1344
Cys Leu Glu Lys Lys Glu Phe Lys Pro Trp Lys Cys Asp Lys Asn Ser
      435   440   445

ttt gaa aca gtt cat cat aaa ggt gta tgt gtg tca ccg aga aga caa   1392
Phe Glu Thr Val His His Lys Gly Val Cys Val Ser Pro Arg Arg Gln
      450   455   460

ggt ttt tgt tta gga aat ttg aac tat cta ctg aat gat gat att tat   1440
Gly Phe Cys Leu Gly Asn Leu Asn Tyr Leu Leu Asn Asp Asp Ile Tyr
465   470   475   480

aat gta cat aat tca caa cta ctt atc gaa att ata atg gct tct aaa   1488
Asn Val His Asn Ser Gln Leu Leu Ile Glu Ile Ile Met Ala Ser Lys
             485   490   495

caa gaa gga aag tta tta tgg aaa aaa cat gga aca ata ctt gat aac   1536
Gln Glu Gly Lys Leu Leu Trp Lys Lys His Gly Thr Ile Leu Asp Asn
             500   505   510

cag aat gca tgc aaa tat ata aat gat agt tat gtt gat tat aaa gat   1584
Gln Asn Ala Cys Lys Tyr Ile Asn Asp Ser Tyr Val Asp Tyr Lys Asp
             515   520   525

ata gtt att gga aat gat tta tgg aat gat aac aac tct ata aaa gtt   1632
Ile Val Ile Gly Asn Asp Leu Trp Asn Asp Asn Asn Ser Ile Lys Val
             530   535   540

caa aat aat tta aat tta att ttt gaa aga aat ttt ggt tat aaa gtt   1680
Gln Asn Asn Leu Asn Leu Ile Phe Glu Arg Asn Phe Gly Tyr Lys Val
545   550   555   560

gga aga aat aaa ctc ttt aaa aca att aaa gaa tta aaa aat gta tgg   1728
Gly Arg Asn Lys Leu Phe Lys Thr Ile Lys Glu Leu Lys Asn Val Trp
             565   570   575

tgg ata tta aat aga aat aaa gta tgg gaa tca atg aga tgt gga att   1776
Trp Ile Leu Asn Arg Asn Lys Val Trp Glu Ser Met Arg Cys Gly Ile
             580   585   590

gac gaa gta gat caa cgt aga aaa act tgt gaa aga ata gat gaa cta   1824
Asp Glu Val Asp Gln Arg Arg Lys Thr Cys Glu Arg Ile Asp Glu Leu
             595   600   605

gaa aac atg cca caa ttc ttt aga tgg ttt tca caa tgg gca cat ttc   1872
Glu Asn Met Pro Gln Phe Phe Arg Trp Phe Ser Gln Trp Ala His Phe
             610   615   620

ttt tgt aag gaa aaa gaa tat tgg gaa tta aaa tta aat gat aaa tgt   1920
Phe Cys Lys Glu Lys Glu Tyr Trp Glu Leu Lys Leu Asn Asp Lys Cys
625   630   635   640

aca ggt aat aat gga aaa tcc tta tgt cag gat aaa aca tgt caa aat   1968
Thr Gly Asn Asn Gly Lys Ser Leu Cys Gln Asp Lys Thr Cys Gln Asn
             645   650   655

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gtg tgt act aat atg aat tat tgg aca tat act aga aaa tta gct tat      2016
Val Cys Thr Asn Met Asn Tyr Trp Thr Tyr Thr Arg Lys Leu Ala Tyr
            660             665                 670

gaa ata caa tcc gta aaa tat gat aaa gat aga aaa tta ttt agt ctt      2064
Glu Ile Gln Ser Val Lys Tyr Asp Lys Asp Arg Lys Leu Phe Ser Leu
            675             680                 685

gct aaa gac aaa aat gta act aca ttt tta aag gaa aat gca aaa aat      2112
Ala Lys Asp Lys Asn Val Thr Thr Phe Leu Lys Glu Asn Ala Lys Asn
            690             695                 700

tgt tct aat ata gat ttt aca aaa ata ttc gat cag ctt gac aaa ctc      2160
Cys Ser Asn Ile Asp Phe Thr Lys Ile Phe Asp Gln Leu Asp Lys Leu
705             710             715                 720

ttt aag gaa aga tgt tca tgt atg gat aca caa gtt tta gaa gta aaa      2208
Phe Lys Glu Arg Cys Ser Cys Met Asp Thr Gln Val Leu Glu Val Lys
                725             730                 735

aac aaa gaa atg tta tct ata gac tca aat agt gaa gat gcg aca gat      2256
Asn Lys Glu Met Leu Ser Ile Asp Ser Asn Ser Glu Asp Ala Thr Asp
                740             745                 750

ata agt gag aaa aat gga gag gaa gaa tta tat gta aat cac aat tct      2304
Ile Ser Glu Lys Asn Gly Glu Glu Glu Leu Tyr Val Asn His Asn Ser
            755             760                 765

gtg agt gtc gca agt ggt aat aaa gaa atc gaa aag agt aag gat gaa      2352
Val Ser Val Ala Ser Gly Asn Lys Glu Ile Glu Lys Ser Lys Asp Glu
770             775             780

aag caa cct gaa aaa gaa gca aaa caa act aat gga act tta acc gta      2400
Lys Gln Pro Glu Lys Glu Ala Lys Gln Thr Asn Gly Thr Leu Thr Val
785             790             795                 800

cga act gac aaa gat tca gat aga aac aaa gga aaa gat aca gct act      2448
Arg Thr Asp Lys Asp Ser Asp Arg Asn Lys Gly Lys Asp Thr Ala Thr
                805             810                 815

gat aca aaa aat tca cct gaa aat tta aaa gta cag gaa cat gga aca      2496
Asp Thr Lys Asn Ser Pro Glu Asn Leu Lys Val Gln Glu His Gly Thr
            820             825                 830

aat gga gaa aca ata aaa gaa gaa cca cca aaa tta cct gaa tca tct      2544
Asn Gly Glu Thr Ile Lys Glu Glu Pro Pro Lys Leu Pro Glu Ser Ser
            835             840                 845

gaa aca tta caa tca caa gaa caa tta gaa gca gaa gca caa aaa caa      2592
Glu Thr Leu Gln Ser Gln Glu Gln Leu Glu Ala Glu Ala Gln Lys Gln
            850             855                 860

aaa caa gaa gaa gaa cca aaa aaa aaa caa gaa gaa gaa cca aaa aaa      2640
Lys Gln Glu Glu Glu Pro Lys Lys Lys Gln Glu Glu Glu Pro Lys Lys
865             870             875                 880
```

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aaa caa gaa gaa gaa caa aaa cga gaa caa gaa caa aaa caa gaa caa      2688
Lys Gln Glu Glu Glu Gln Lys Arg Glu Gln Glu Gln Lys Gln Glu Gln
            885             890             895


gaa gaa gaa gaa caa aaa caa gaa gaa gaa caa caa ata caa gat caa      2736
Glu Glu Glu Glu Gln Lys Gln Glu Glu Glu Gln Gln Ile Gln Asp Gln
            900             905             910


tca caa agt gga tta gat caa tcc tca aaa gta gga gta gcg agt gaa      2784
Ser Gln Ser Gly Leu Asp Gln Ser Ser Lys Val Gly Val Ala Ser Glu
            915             920             925


caa aat gaa att tct tca gga caa gaa caa aac gta aaa agc tct tca      2832
Gln Asn Glu Ile Ser Ser Gly Gln Glu Gln Asn Val Lys Ser Ser Ser
930             935             940


cct gaa gta gtt cca caa gaa aca act agt gaa aat ggg tca tca caa      2880
Pro Glu Val Val Pro Gln Glu Thr Thr Ser Glu Asn Gly Ser Ser Gln
945             950             955             960


gac aca aaa ata tca agt act gaa cca aat gag aat tct gtt gta gat      2928
Asp Thr Lys Ile Ser Ser Thr Glu Pro Asn Glu Asn Ser Val Val Asp
            965             970             975


aga gca aca gat agt atg aat tta gat cct gaa aag gtt cat aat gaa      2976
Arg Ala Thr Asp Ser Met Asn Leu Asp Pro Glu Lys Val His Asn Glu
            980             985             990


aat atg agt gat cca aat aca aat act gaa cca gat gca tct tta aaa      3024
Asn Met Ser Asp Pro Asn Thr Asn Thr Glu Pro Asp Ala Ser Leu Lys
            995             1000            1005


gat gat aag aag gaa gtt gat gat gcc aaa aaa gaa ctt caa tct          3069
Asp Asp Lys Lys Glu Val Asp Asp Ala Lys Lys Glu Leu Gln Ser
    1010            1015            1020


act gta tca aga att gaa tct aat gaa cag gac gtt caa agt aca          3114
Thr Val Ser Arg Ile Glu Ser Asn Glu Gln Asp Val Gln Ser Thr
    1025            1030            1035


cca ccc gaa gat act cct act gtt gaa gga aaa gta gga gat aaa          3159
Pro Pro Glu Asp Thr Pro Thr Val Glu Gly Lys Val Gly Asp Lys
    1040            1045            1050


gca gaa atg tta act tct ccg cat gcg aca gat aat tct gag tcg          3204
Ala Glu Met Leu Thr Ser Pro His Ala Thr Asp Asn Ser Glu Ser
    1055            1060            1065


gaa tca ggt tta aat cca act gat gac att aaa aca act gat ggt          3249
Glu Ser Gly Leu Asn Pro Thr Asp Asp Ile Lys Thr Thr Asp Gly
    1070            1075            1080


gtt gtt aaa gaa caa gaa ata tta ggg gga ggt gaa agt gca act          3294
Val Val Lys Glu Gln Glu Ile Leu Gly Gly Gly Glu Ser Ala Thr
    1085            1090            1095
```

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gaa aca tca aaa agt aat tta  gaa aaa cct aag gat  gtt gaa cct      3339
Glu Thr Ser Lys Ser Asn Leu  Glu Lys Pro Lys Asp  Val Glu Pro
    1100             1105              1110

tct cat gaa ata tct gaa cct  gtt ctt tct ggt aca  act ggt aaa      3384
Ser His Glu Ile Ser Glu Pro  Val Leu Ser Gly Thr  Thr Gly Lys
    1115             1120              1125

gaa gaa tca gag tta tta aaa  agt aaa tcg ata gag  acg aag ggg      3429
Glu Glu Ser Glu Leu Leu Lys  Ser Lys Ser Ile Glu  Thr Lys Gly
    1130             1135              1140

gaa aca gat cct cga agt aat  gac caa gaa gat gct  act gac gat      3474
Glu Thr Asp Pro Arg Ser Asn  Asp Gln Glu Asp Ala  Thr Asp Asp
    1145             1150              1155

gtt gta gaa aat agt aga gat  gat aat aat agt ctc  tct aat agc      3519
Val Val Glu Asn Ser Arg Asp  Asp Asn Asn Ser Leu  Ser Asn Ser
    1160             1165              1170

gta gat aat caa agt aat gtt  tta aat aga gaa gat  cct att gct      3564
Val Asp Asn Gln Ser Asn Val  Leu Asn Arg Glu Asp  Pro Ile Ala
    1175             1180              1185

tct gaa act gaa gtt gta agt  gaa cct gag gat tca  agt agg ata      3609
Ser Glu Thr Glu Val Val Ser  Glu Pro Glu Asp Ser  Ser Arg Ile
    1190             1195              1200

atg act aca gaa gtt cca agt  act act gta aaa ccc  cct gat gaa      3654
Met Thr Thr Glu Val Pro Ser  Thr Thr Val Lys Pro  Pro Asp Glu
    1205             1210              1215

aaa cga tct gaa gaa gta gga  gaa aaa gaa gct aaa  gaa att aaa      3699
Lys Arg Ser Glu Glu Val Gly  Glu Lys Glu Ala Lys  Glu Ile Lys
    1220             1225              1230

gta gaa cct gtt gta cca aga  gcc att gga gaa cca  atg gaa aat      3744
Val Glu Pro Val Val Pro Arg  Ala Ile Gly Glu Pro  Met Glu Asn
    1235             1240              1245

tct gtg agc gta cag tcc cct  cct aat gta gaa gat  gtt gaa aaa      3789
Ser Val Ser Val Gln Ser Pro  Pro Asn Val Glu Asp  Val Glu Lys
    1250             1255              1260

gaa aca ttg ata tct gag aat  aat gga tta cat aat  gat aca cac      3834
Glu Thr Leu Ile Ser Glu Asn  Asn Gly Leu His Asn  Asp Thr His
    1265             1270              1275

aga gga aat atc agt gaa aag  gat tta atc gat att  cat ttg tta      3879
Arg Gly Asn Ile Ser Glu Lys  Asp Leu Ile Asp Ile  His Leu Leu
    1280             1285              1290

aga aat gaa gcg ggt agt aca  ata tta gat gat tct  aga aga aat      3924
Arg Asn Glu Ala Gly Ser Thr  Ile Leu Asp Asp Ser  Arg Arg Asn
    1295             1300              1305
```

```
gga gaa atg aca gaa ggt agc  gaa agt gat gtt gga  gaa tta caa        3969
Gly Glu Met Thr Glu Gly Ser  Glu Ser Asp Val Gly  Glu Leu Gln
    1310            1315               1320


gaa cat aat ttt agc aca caa  caa aaa gat gaa aaa  gat ttt gac        4014
Glu His Asn Phe Ser Thr Gln  Gln Lys Asp Glu Lys  Asp Phe Asp
    1325            1330               1335


caa att gcg agc gat aga gaa  aaa gaa gaa att caa  aaa tta ctt        4059
Gln Ile Ala Ser Asp Arg Glu  Lys Glu Glu Ile Gln  Lys Leu Leu
    1340            1345               1350


aat ata gga cat gaa gag gat  gaa gat gta tta aaa  atg gat aga        4104
Asn Ile Gly His Glu Glu Asp  Glu Asp Val Leu Lys  Met Asp Arg
    1355            1360               1365


aca gag gat agt atg agt gat  gga gtt aat agt cat  ttg tat tat        4149
Thr Glu Asp Ser Met Ser Asp  Gly Val Asn Ser His  Leu Tyr Tyr
    1370            1375               1380


aat aat cta tca agt gaa gaa  aaa atg gaa caa tat  aat aat aga        4194
Asn Asn Leu Ser Ser Glu Glu  Lys Met Glu Gln Tyr  Asn Asn Arg
    1385            1390               1395


gat gct tct aaa gat aga gaa  gaa ata ttg aat agg  tca aac aca        4239
Asp Ala Ser Lys Asp Arg Glu  Glu Ile Leu Asn Arg  Ser Asn Thr
    1400            1405               1410


aat aca tgt tct aat gaa cat  tca tta aaa tat tgt  caa tat atg        4284
Asn Thr Cys Ser Asn Glu His  Ser Leu Lys Tyr Cys  Gln Tyr Met
    1415            1420               1425


gaa aga aat aag gat tta tta  gaa aca tgt tct gaa  gac aaa agg        4329
Glu Arg Asn Lys Asp Leu Leu  Glu Thr Cys Ser Glu  Asp Lys Arg
    1430            1435               1440


tta cat tta tgt tgt gaa ata  tca gat tat tgt tta  aaa ttt ttc        4374
Leu His Leu Cys Cys Glu Ile  Ser Asp Tyr Cys Leu  Lys Phe Phe
    1445            1450               1455


aat cct aaa tcg ata gaa tac  ttt gat tgt aca caa  aaa gaa ttt        4419
Asn Pro Lys Ser Ile Glu Tyr  Phe Asp Cys Thr Gln  Lys Glu Phe
    1460            1465               1470


gat gac cct aca tat aat tgt  ttt aga aaa caa aga  ttt aca agt        4464
Asp Asp Pro Thr Tyr Asn Cys  Phe Arg Lys Gln Arg  Phe Thr Ser
    1475            1480               1485


atgtcatgtt ataaaattaa aaacaatata cattaatatg ttaataaaaa aaataatata   4524


tttttttctc tttttctttt ttttaatag gt atg cat  tat att gcc ggg ggt    4577
                                  Met His  Tyr Ile Ala Gly Gly
                                      1490               1495


ggt ata ata gcc ctt  tta ttg ttt att tta  ggt tca gcc agc tat      4622
Gly Ile Ile Ala Leu  Leu Leu Phe Ile Leu  Gly Ser Ala Ser Tyr
            1500           1505               1510
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agg aag aat ttg taagaaaaaa aggatgaaga aatataaaca aaaatataaa                    4674
Arg Lys Asn Leu


tatatgcata tatatttaag tattataaga acatatatat aaataaatat gtatattttt             4734

attttattat tatagg gat  gat gaa aaa gga ttc  tac gat tct aat tta              4783
               Asp  Asp Glu Lys Gly Phe  Tyr Asp Ser Asn Leu
               1515                1520                1525

aat gat tct gct ttt  gaa tat aat aat aat  aaa tat aat aaa tta               4828
Asn Asp Ser Ala Phe  Glu Tyr Asn Asn Asn  Lys Tyr Asn Lys Leu
            1530                1535                1540

cct tat atg tgtaaggaaa aaactaaaaa acaaaaaaaa aaaaaaatat                       4877
Pro Tyr Met


atatatatat atatatattt acggatgcat ttccacattc ctattatttc ttattcttat            4937

aatttttatt atttatttat ttatttttttt ttttc gta gtt  gat caa caa ata             4990
                                         Val Val  Asp Gln Gln Ile
                                         1545

aat gta gta aat tct gat  tta tat tcg gag ggt  att tat gat gac               5035
Asn Val Val Asn Ser Asp  Leu Tyr Ser Glu Gly  Ile Tyr Asp Asp
1550                1555                1560

aca acg aca ttt taa                                                          5050
Thr Thr Thr Phe
1565


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<213>  Plasmodium falciparum

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Met Lys Gly Lys Met Asn Met Cys Leu Phe Phe Phe Tyr Ser Ile Leu
1                   5               10              15


Tyr Val Val Leu Cys Thr Tyr Val Leu Gly Ile Ser Glu Glu Tyr Leu
            20              25              30


Lys Glu Arg Pro Gln Gly Leu Asn Val Glu Thr Asn Asn Asn Asn Asn
        35              40              45


Asn Asn Asn Asn Asn Asn Ser Asn Ser Asn Asp Ala Met Ser Phe Val
    50              55              60


Asn Glu Val Ile Arg Phe Ile Glu Asn Glu Lys Asp Asp Lys Glu Asp
65              70              75              80
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```
Lys Lys Val Lys Ile Ile Ser Arg Pro Val Glu Asn Thr Leu His Arg
             85                  90                  95

Tyr Pro Val Ser Ser Phe Leu Asn Ile Lys Lys Tyr Gly Arg Lys Gly
            100                 105                 110

Glu Tyr Leu Asn Arg Asn Ser Phe Val Gln Arg Ser Tyr Ile Arg Gly
            115                 120                 125

Cys Lys Gly Lys Arg Ser Thr His Thr Trp Ile Cys Glu Asn Lys Gly
    130                 135                 140

Asn Asn Asn Ile Cys Ile Pro Asp Arg Arg Val Gln Leu Cys Ile Thr
145                 150                 155                 160

Ala Leu Gln Asp Leu Lys Asn Ser Gly Ser Glu Thr Thr Asp Arg Lys
                165                 170                 175

Leu Leu Arg Asp Lys Val Phe Asp Ser Ala Met Tyr Glu Thr Asp Leu
            180                 185                 190

Leu Trp Asn Lys Tyr Gly Phe Arg Gly Phe Asp Asp Phe Cys Asp Asp
            195                 200                 205

Val Lys Asn Ser Tyr Leu Asp Tyr Lys Asp Val Ile Phe Gly Thr Asp
    210                 215                 220

Leu Asp Lys Asn Asn Ile Ser Lys Leu Val Glu Glu Ser Leu Lys Arg
225                 230                 235                 240

Phe Phe Lys Lys Asp Ser Ser Val Leu Asn Pro Thr Ala Trp Trp Arg
                245                 250                 255

Arg Tyr Gly Thr Arg Leu Trp Lys Thr Met Ile Gln Pro Tyr Ala His
            260                 265                 270

Leu Gly Cys Arg Lys Pro Asp Glu Asn Glu Pro Gln Ile Asn Arg Trp
            275                 280                 285

Ile Leu Glu Trp Gly Lys Tyr Asn Cys Arg Leu Met Lys Glu Lys Glu
    290                 295                 300

Lys Leu Leu Thr Gly Glu Cys Ser Val Asn Arg Lys Lys Ser Asp Cys
305                 310                 315                 320
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Ser Thr Gly Cys Asn Asn Glu Cys Tyr Thr Tyr Arg Ser Leu Ile Asn
            325                 330             335

Arg Gln Arg Tyr Glu Val Ser Ile Leu Gly Lys Lys Tyr Ile Lys Val
            340                 345             350

Val Arg Tyr Thr Ile Phe Arg Arg Lys Ile Val Gln Pro Asp Asn Ala
            355             360             365

Leu Asp Phe Leu Lys Leu Asn Cys Ser Glu Cys Lys Asp Ile Asp Phe
    370             375             380

Lys Pro Phe Phe Glu Phe Glu Tyr Gly Lys Tyr Glu Glu Lys Cys Met
385             390             395                 400

Cys Gln Ser Tyr Ile Asp Leu Lys Ile Gln Phe Lys Asn Asn Asp Ile
            405             410             415

Cys Ser Phe Asn Ala Gln Thr Asp Thr Val Ser Ser Asp Lys Arg Phe
            420             425             430

Cys Leu Glu Lys Lys Glu Phe Lys Pro Trp Lys Cys Asp Lys Asn Ser
            435             440             445

Phe Glu Thr Val His His Lys Gly Val Cys Val Ser Pro Arg Arg Gln
    450             455             460

Gly Phe Cys Leu Gly Asn Leu Asn Tyr Leu Leu Asn Asp Asp Ile Tyr
465             470             475             480

Asn Val His Asn Ser Gln Leu Leu Ile Glu Ile Ile Met Ala Ser Lys
            485             490             495

Gln Glu Gly Lys Leu Leu Trp Lys Lys His Gly Thr Ile Leu Asp Asn
            500             505             510

Gln Asn Ala Cys Lys Tyr Ile Asn Asp Ser Tyr Val Asp Tyr Lys Asp
            515             520             525

Ile Val Ile Gly Asn Asp Leu Trp Asn Asp Asn Asn Ser Ile Lys Val
    530             535             540
```

```
Gln Asn Asn Leu Asn Leu Ile Phe Glu Arg Asn Phe Gly Tyr Lys Val
545                 550             555                 560


Gly Arg Asn Lys Leu Phe Lys Thr Ile Lys Glu Leu Lys Asn Val Trp
                565             570             575


Trp Ile Leu Asn Arg Asn Lys Val Trp Glu Ser Met Arg Cys Gly Ile
            580             585             590


Asp Glu Val Asp Gln Arg Arg Lys Thr Cys Glu Arg Ile Asp Glu Leu
            595             600             605


Glu Asn Met Pro Gln Phe Phe Arg Trp Phe Ser Gln Trp Ala His Phe
        610             615             620


Phe Cys Lys Glu Lys Glu Tyr Trp Glu Leu Lys Leu Asn Asp Lys Cys
625             630             635             640


Thr Gly Asn Asn Gly Lys Ser Leu Cys Gln Asp Lys Thr Cys Gln Asn
                645             650             655


Val Cys Thr Asn Met Asn Tyr Trp Thr Tyr Thr Arg Lys Leu Ala Tyr
            660             665             670


Glu Ile Gln Ser Val Lys Tyr Asp Lys Asp Arg Lys Leu Phe Ser Leu
        675             680             685


Ala Lys Asp Lys Asn Val Thr Thr Phe Leu Lys Glu Asn Ala Lys Asn
    690             695             700


Cys Ser Asn Ile Asp Phe Thr Lys Ile Phe Asp Gln Leu Asp Lys Leu
705             710             715             720


Phe Lys Glu Arg Cys Ser Cys Met Asp Thr Gln Val Leu Glu Val Lys
            725             730             735


Asn Lys Glu Met Leu Ser Ile Asp Ser Asn Ser Glu Asp Ala Thr Asp
        740             745             750


Ile Ser Glu Lys Asn Gly Glu Glu Glu Leu Tyr Val Asn His Asn Ser
        755             760             765


Val Ser Val Ala Ser Gly Asn Lys Glu Ile Glu Lys Ser Lys Asp Glu
    770             775             780
```

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Lys Gln Pro Glu Lys Glu Ala Lys Gln Thr Asn Gly Thr Leu Thr Val
785             790         795             800

Arg Thr Asp Lys Asp Ser Asp Arg Asn Lys Gly Lys Asp Thr Ala Thr
            805             810             815

Asp Thr Lys Asn Ser Pro Glu Asn Leu Lys Val Gln Glu His Gly Thr
            820             825             830

Asn Gly Glu Thr Ile Lys Glu Glu Pro Pro Lys Leu Pro Glu Ser Ser
        835             840             845

Glu Thr Leu Gln Ser Gln Glu Gln Leu Glu Ala Glu Ala Gln Lys Gln
    850             855             860

Lys Gln Glu Glu Glu Pro Lys Lys Lys Gln Glu Glu Glu Pro Lys Lys
865             870             875             880

Lys Gln Glu Glu Glu Gln Lys Arg Glu Gln Glu Gln Lys Gln Glu Gln
            885             890             895

Glu Glu Glu Glu Gln Lys Gln Glu Glu Glu Gln Gln Ile Gln Asp Gln
            900             905             910

Ser Gln Ser Gly Leu Asp Gln Ser Ser Lys Val Gly Val Ala Ser Glu
        915             920             925

Gln Asn Glu Ile Ser Ser Gly Gln Glu Gln Asn Val Lys Ser Ser Ser
    930             935             940

Pro Glu Val Val Pro Gln Glu Thr Thr Ser Glu Asn Gly Ser Ser Gln
945             950             955             960

Asp Thr Lys Ile Ser Ser Thr Glu Pro Asn Glu Asn Ser Val Val Asp
            965             970             975

Arg Ala Thr Asp Ser Met Asn Leu Asp Pro Glu Lys Val His Asn Glu
            980             985             990

Asn Met Ser Asp Pro Asn Thr Asn Thr Glu Pro Asp Ala Ser Leu Lys
        995             1000            1005
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Asp Asp  Lys Lys Glu Val Asp  Asp Ala Lys Lys Glu  Leu Gln Ser
    1010                 1015              1020

Thr Val  Ser Arg Ile Glu Ser  Asn Glu Gln Asp Val  Gln Ser Thr
    1025                 1030              1035

Pro Pro  Glu Asp Thr Pro Thr  Val Glu Gly Lys Val  Gly Asp Lys
    1040                 1045              1050

Ala Glu  Met Leu Thr Ser Pro  His Ala Thr Asp Asn  Ser Glu Ser
    1055                 1060              1065

Glu Ser  Gly Leu Asn Pro Thr  Asp Asp Ile Lys Thr  Thr Asp Gly
    1070                 1075              1080

Val Val  Lys Glu Gln Glu Ile  Leu Gly Gly Gly Glu  Ser Ala Thr
    1085                 1090              1095

Glu Thr  Ser Lys Ser Asn Leu  Glu Lys Pro Lys Asp  Val Glu Pro
    1100                 1105              1110

Ser His  Glu Ile Ser Glu Pro  Val Leu Ser Gly Thr  Thr Gly Lys
    1115                 1120              1125

Glu Glu  Ser Glu Leu Leu Lys  Ser Lys Ser Ile Glu  Thr Lys Gly
    1130                 1135              1140

Glu Thr  Asp Pro Arg Ser Asn  Asp Gln Glu Asp Ala  Thr Asp Asp
    1145                 1150              1155

Val Val  Glu Asn Ser Arg Asp  Asp Asn Asn Ser Leu  Ser Asn Ser
    1160                 1165              1170

Val Asp  Asn Gln Ser Asn Val  Leu Asn Arg Glu Asp  Pro Ile Ala
    1175                 1180              1185

Ser Glu  Thr Glu Val Val Ser  Glu Pro Glu Asp Ser  Ser Arg Ile
    1190                 1195              1200

Met Thr  Thr Glu Val Pro Ser  Thr Thr Val Lys Pro  Pro Asp Glu
    1205                 1210              1215

Lys Arg  Ser Glu Glu Val Gly  Glu Lys Glu Ala Lys  Glu Ile Lys
    1220                 1225              1230
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Val Glu  Pro Val Val Pro Arg  Ala Ile Gly Glu Pro  Met Glu Asn
    1235              1240              1245


Ser Val  Ser Val Gln Ser Pro  Pro Asn Val Glu Asp  Val Glu Lys
    1250              1255              1260


Glu Thr  Leu Ile Ser Glu Asn  Asn Gly Leu His Asn  Asp Thr His
    1265              1270              1275


Arg Gly  Asn Ile Ser Glu Lys  Asp Leu Ile Asp Ile  His Leu Leu
    1280              1285              1290


Arg Asn  Glu Ala Gly Ser Thr  Ile Leu Asp Asp Ser  Arg Arg Asn
    1295              1300              1305


Gly Glu  Met Thr Glu Gly Ser  Glu Ser Asp Val Gly  Glu Leu Gln
    1310              1315              1320


Glu His  Asn Phe Ser Thr Gln  Gln Lys Asp Glu Lys  Asp Phe Asp
    1325              1330              1335


Gln Ile  Ala Ser Asp Arg Glu  Lys Glu Glu Ile Gln  Lys Leu Leu
    1340              1345              1350


Asn Ile  Gly His Glu Glu Asp  Glu Asp Val Leu Lys  Met Asp Arg
    1355              1360              1365


Thr Glu  Asp Ser Met Ser Asp  Gly Val Asn Ser His  Leu Tyr Tyr
    1370              1375              1380


Asn Asn  Leu Ser Ser Glu Glu  Lys Met Glu Gln Tyr  Asn Asn Arg
    1385              1390              1395


Asp Ala  Ser Lys Asp Arg Glu  Glu Ile Leu Asn Arg  Ser Asn Thr
    1400              1405              1410


Asn Thr  Cys Ser Asn Glu His  Ser Leu Lys Tyr Cys  Gln Tyr Met
    1415              1420              1425


Glu Arg  Asn Lys Asp Leu Leu  Glu Thr Cys Ser Glu  Asp Lys Arg
    1430              1435              1440
```

```
Leu His  Leu Cys Cys Glu Ile  Ser Asp Tyr Cys Leu  Lys Phe Phe
    1445                 1450                 1455


Asn Pro  Lys Ser Ile Glu Tyr  Phe Asp Cys Thr Gln  Lys Glu Phe
    1460                 1465                 1470


Asp Asp  Pro Thr Tyr Asn Cys  Phe Arg Lys Gln Arg  Phe Thr Ser
    1475                 1480                 1485


Met His  Tyr Ile Ala Gly Gly  Gly Ile Ile Ala Leu  Leu Leu Phe
    1490                 1495                 1500


Ile Leu  Gly Ser Ala Ser Tyr  Arg Lys Asn Leu Asp  Asp Glu Lys
    1505                 1510                 1515


Gly Phe  Tyr Asp Ser Asn Leu  Asn Asp Ser Ala Phe  Glu Tyr Asn
    1520                 1525                 1530


Asn Asn  Lys Tyr Asn Lys Leu  Pro Tyr Met Val Val  Asp Gln Gln
    1535                 1540                 1545


Ile Asn  Val Val Asn Ser Asp  Leu Tyr Ser Glu Gly  Ile Tyr Asp
    1550                 1555                 1560


Asp Thr  Thr Thr Phe
    1565


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<210>    14
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24

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